

Wetlands scenario

Prepared by:

Karolina Stark (Sweden), Tamara Yankovich (Canada), Mike Wood (UK), Nick Beresford (UK) & Pål Andersson (Sweden).

Why this wetland scenario?

- Most models consider terrestrial and aquatic ecosystems but not specifically wetlands.
 - How are modellers approaching a mixed ecosystem?
 - Are transfer parameters given for terrestrial and aquatic systems also valid for wetlands?
- C14 media concentrations are available

Scenario in short

- Participants are given measured radionuclide activity-concentrations in soil, water, and air from wetland areas, whereas few other parameters are specified in the scenario description.

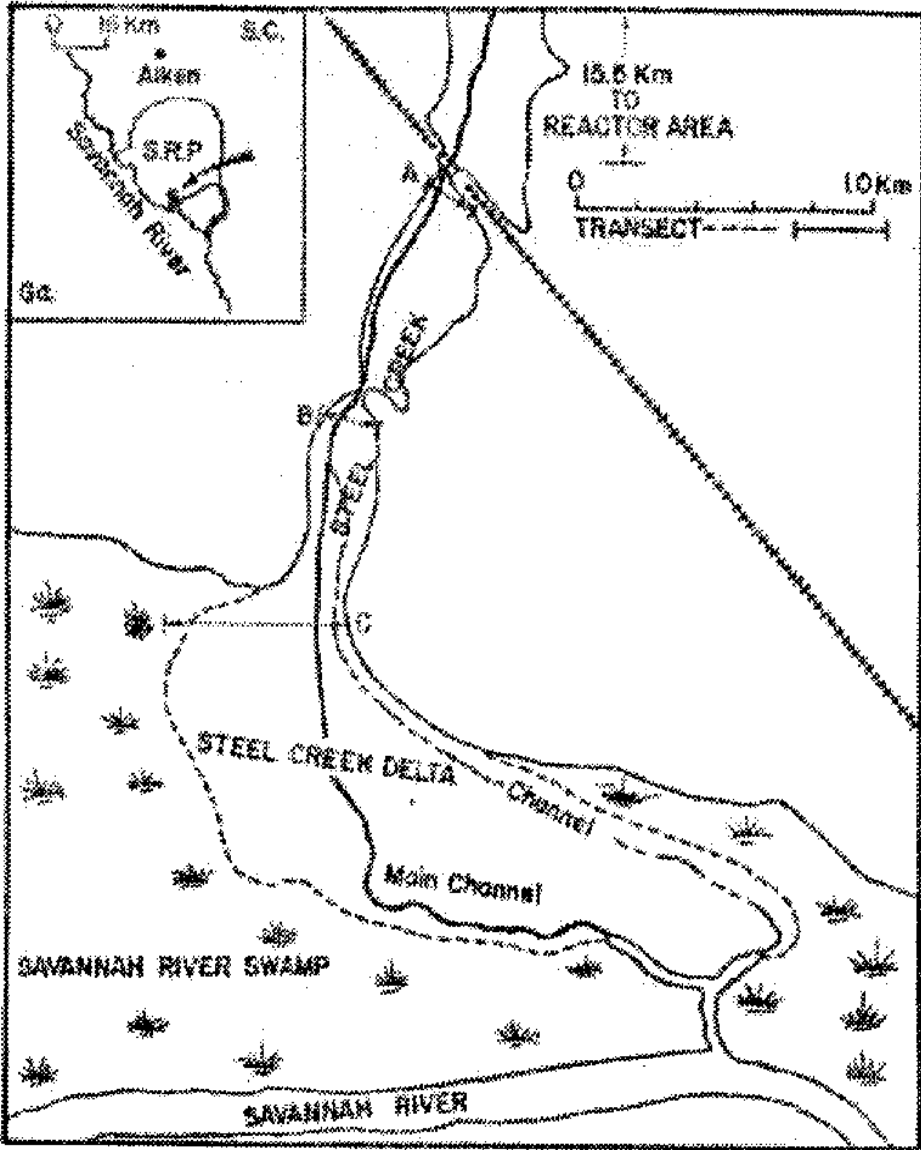
Scenario in short

- Participants are asked to estimate whole organism radionuclide concentrations in specified organisms including grasses, mosses, shrubs, trees, insects, small mammals, frogs and snakes. Resulting external and internal doses to these organisms should also be reported.

Scenario in short

- Evaluation of the exercise will include model-model comparisons of whole organism activity concentrations and doses as well as model-measurement comparisons of whole organism activity concentrations and, for one species, external dose rate in soil.

Steel Creek, USA



Reactor cooling water contaminated with Cs-137.

Soil sampling along transects

Creek water sampling

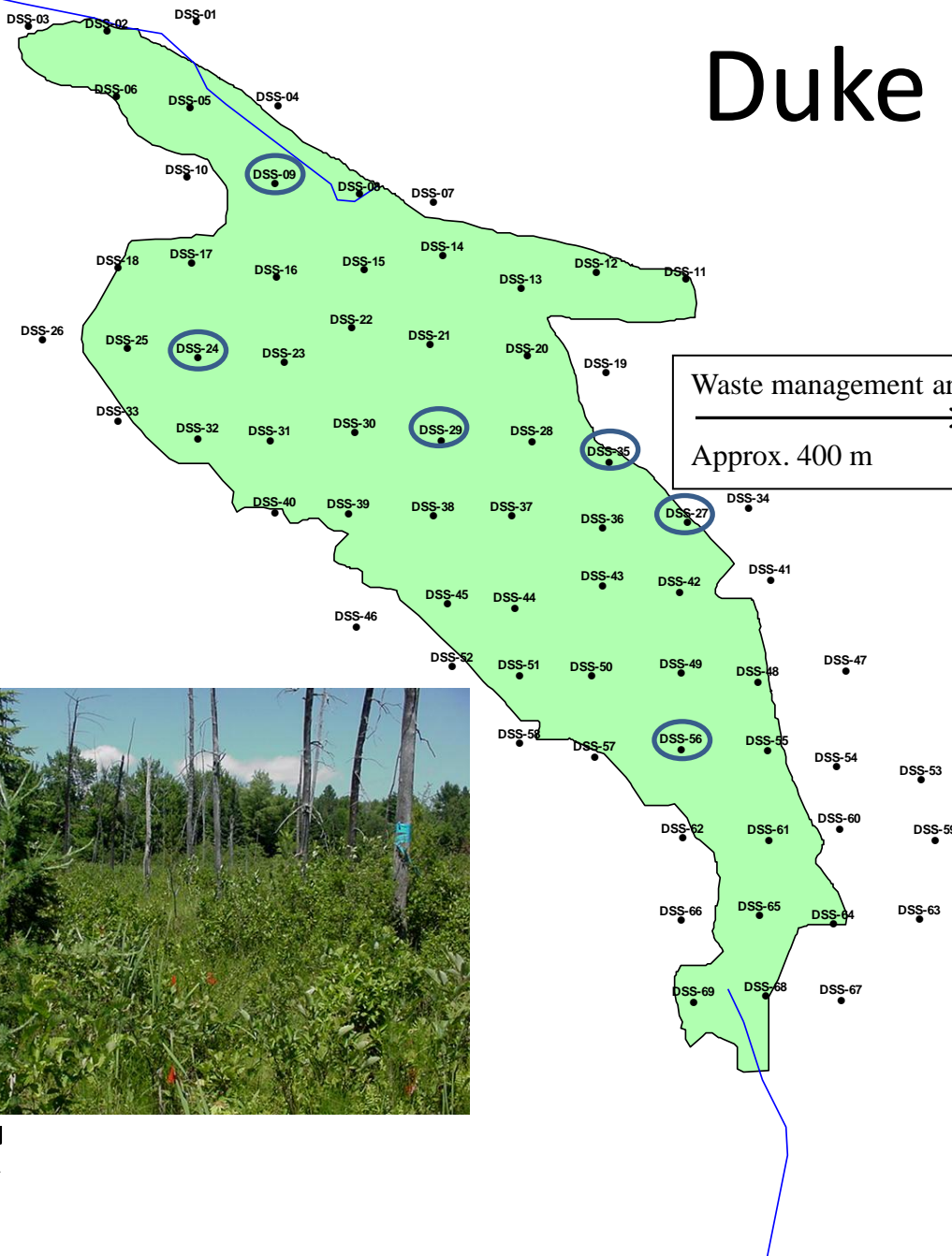
Biota sampling: grass, bushes, ducks, frogs, snakes, insects, spiders.



Utnora, Sweden

- Stream water contaminated with Cs-137 from Chernobyl floods the swamp.
- Soil sampling in the swamp
- Water sampling in the swamp
- Biota sampling: trees, forbs, frogs
- Frog phantoms in soil

Duke swamp, Canada



- C-14 contamination of the swamp through ground water
- Soil and air sampling stations
- Biota sampling: trees, forbs, grass, insects, frogs, snakes, small mammals.



What to do?

- Best estimate of mean biota concentration for the species specified in instructions
- For the comparison with measured biota data, best estimates of biota concentrations corresponding to min and max measured media activity concentrations.

What to do?

- Mean internal and external dose rates should be reported. If appropriate, dose rates should be specified for the terrestrial and the aquatic part of the ecosystem.

Area	Radionuclide	Organism	scientific name
Steel Creek Floodplain	Cs-137	Grasses, sedges	Andropogon
Steel Creek Floodplain	Cs-137	Alder tree	Alnus
Steel Creek Floodplain	Cs-137	Shrubs	Myrica
Steel Creek Floodplain	Cs-137	Willows etc	Salix
Steel Creek Floodplain	Cs-137	Green treefrog	Hyla cinerea
Steel Creek Floodplain	Cs-137	Aquatic snakes	
Steel Creek Floodplain	Cs-137	Terrestrial snakes	
		Ducks (ringneck, mallard)	
Steel Creek Floodplain	Cs-137	Spiders	Araneae
Steel Creek Floodplain	Cs-137	Beetles	Coleoptera
Steel Creek Floodplain	Cs-137	Aphids, leafhoppers, cicadas	Homoptera
Steel Creek Floodplain	Cs-137	Grasshoppers, crickets	Orthoptera
Utnora Riparian Alder Swamp	Cs-137	Spruce	Picea abiea
Utnora Riparian Alder Swamp	Cs-137	Fern	Matteuccia struthiopteris
Utnora Riparian Alder Swamp	Cs-137	Alder tree	Alnus Glutinosa
			Filipendula ulmaria , Urtica dioica, Scirpus sylvaticus, Lysimachia thyrifolia
Utnora Riparian Alder Swamp	Cs-137	Forbs, sedges	
Utnora Riparian Alder Swamp	Cs-137	Moor frog	Rana arvalis

Duke swamp	C-14	Balsam fir	<i>Abies balsamea</i>
Duke swamp	C-14	Cedar	<i>Thuja</i> spp.
Duke swamp	C-14	Ferns	
Duke swamp	C-14	Forbs	
Duke swamp	C-14	Grass	
Duke swamp	C-14	Peat moss	<i>Sphagnum</i> spp.
Duke swamp	C-14	deer flies, horse flies, other types of flies, wasps and moths	Aerial insects (mixed species)
Duke swamp	C-14	Carrion beetles	Silphidae
Duke swamp	C-14	American toad	<i>Bufo americanus</i>
Duke swamp	C-14	Grey treefrog	<i>Hyla versicolor</i>
Duke swamp	C-14	American bullfrog	<i>Rana catesbeiana</i>
Duke swamp	C-14	Green frog	<i>Rana clamitans</i>
Duke swamp	C-14	Northern leopard frog	<i>Rana pipiens</i>
Duke swamp	C-14	Mink frog	<i>Rana septentrionalis</i>
Duke swamp	C-14	Common garter snake	<i>Thamnophis sirtalis</i>
Duke swamp	C-14	Northern short-tailed shrew	<i>Blarina brevicauda</i>
Duke swamp	C-14	White-footed mouse	<i>Peromyscus leucopus</i>
Duke swamp	C-14	Deer mouse	<i>Peromyscus maniculatus</i>
Duke swamp	C-14	Meadow vole	<i>Microtus pennsylvanicus</i>

